

From the INTERNATIONAL BUREAU

**PCT****NOTIFICATION CONCERNING  
TRANSMITTAL OF COPY OF INTERNATIONAL  
PRELIMINARY REPORT ON PATENTABILITY  
(CHAPTER I OF THE PATENT COOPERATION  
TREATY)**

(PCT Rule 44bis.1(c))

To:

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Date of mailing (*day/month/year*)  
18 May 2007 (18.05.2007)

Applicant's or agent's file reference  
09991-182WO1

**IMPORTANT NOTICE**

International application No.  
PCT/US2005/038743

International filing date (*day/month/year*)  
26 October 2005 (26.10.2005)

Priority date (*day/month/year*)  
03 November 2004 (03.11.2004)

Applicant  
FUJIFILM DIMATIX, INC. et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO  
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# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference <b>09991-182WO1</b>	<b>FOR FURTHER ACTION</b>	See item 4 below
International application No. <b>PCT/US2005/038743</b>	International filing date ( <i>day/month/year</i> ) <b>26 October 2005 (26.10.2005)</b>	Priority date ( <i>day/month/year</i> ) <b>03 November 2004 (03.11.2004)</b>
International Patent Classification (8th edition unless older edition indicated) <b>See relevant information in Form PCT/ISA/237</b>		
Applicant <b>FUJIFILM DIMATIX, INC.</b>		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 7 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 80%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report <b>08 May 2007 (08.05.2007)</b>
Facsimile No. +41 22 338 82 70	Authorized officer  <div style="text-align: right; font-size: 1.2em;">Nora Lindner</div>
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# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 05 APR 2006

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2005/038743

International filing date (day/month/year)  
26.10.2005

Priority date (day/month/year)  
03.11.2004

International Patent Classification (IPC) or both national classification and IPC  
INV. B41J2/045

Applicant  
DIMATIX, INC.

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/038743

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/038743

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	12-22, 27
	No: Claims	1-11, 23-26
Inventive step (IS)	Yes: Claims	
	No: Claims	1-27
Industrial applicability (IA)	Yes: Claims	1-27
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**V Statement concerning novelty, inventive step & industrial applicability**

- 1 Claim 19 includes all features of claim 24 and should be recast as a dependent claim, depending on claim 24 (Guidelines C-III 3.5, Rule 6.4(a) PCT). The claims must then be renumbered accordingly.
- 2 Document D1 = EP-A-0 876 915 (see especially column 1 line 45 to column 2 line 26, figures 13a, 13b) discloses a system to control printing of an inkjet printer, the system comprising:
  - a filter circuit (figure 13a) to filter high-frequency signals in input waveform signals, wherein the filter circuit is configured to provide stable firing waveform signals for an actuator for ink droplet ejection, the filter circuit comprising:
    - an effective resistance formed from a plurality of resistors (R1-R6) electrically connected in parallel, wherein a first end of the parallel connection is connected to an input waveform terminal (V) and a second end of the parallel connection is connected to the actuator (C) for ink droplet ejection; and a plurality of switches, wherein at least one switch is configured to connect at least one of the plurality of resistors (R1-R6) in parallel with another resistor (R1-R6), and wherein each switch is configured to be electrically connected in series with a resistor (R1-R6); and a controller to control which of the plurality of switches are electrically connected to determine a resistance value for the effective resistance, wherein a frequency response of the filter circuit is related to the effective resistance and a capacitance of the actuator.
- 2.1 Similarly, D1 (see especially column 1 line 45 to column 2 line 26, figures 13a, 13b) also discloses a method to control a response of a droplet ejection device comprising a plurality of switches (figure 13a) and a piezoelectric actuator (C), the method comprising: connecting the plurality of switches to the piezoelectric actuator (C), wherein each switch comprises an input terminal to connect to a waveform signal (V), an output terminal to connect to the piezoelectric actuator (C), a control signal terminal to control a connection of the switch with a control signal ("switching by transistor"), and a resistance (R1-R6) between the input terminal and output terminal; selecting a waveform signal to apply to the input terminal of each of the plurality of switches; applying the selected waveform signal on the input terminal of each of the plurality of switches, wherein the each of the plurality of switches are connected at a common output terminal at the piezoelectric actuator (C); and controlling the control

signal terminal of each switch with the control signal.

- 2.2 The subject matter of claims 1 and 24 does not differ from the above. Claims 1 and 24 are not new.

Therefore, the subject matter of independent claims 1 and 24 does not satisfy the criteria set forth in Articles 33(2) PCT.

- 3 D2 = US-A-6 517 195 (see especially column 6 line 13 to column 7 line 15, figures 5a-5d) discloses a method and apparatus from which the subject matter of claims 1 and 24 only differ in that the capacitive actuator is of an electrostatic type instead of a piezoelectric type. Such a minor change comes within the normal practice of the art of the skilled person. The invention therefore consists merely in the use of technique known from D2 in a closely analogous situation (Guidelines C-IV, Annex 1, 1.1(v)). Therefore, the subject matter of independent claims 1 and 24 does not satisfy the criteria set forth in Articles 33(3) PCT.

- 4 Furthermore, D1 (see especially column 1 lines 20 - 44) concerns a piezoelectric ink jet printer and therefore discloses an electrically actuated displacement device configured to move between a displaced position and an undisplaced position to change the volume of a fluid chamber as a charge associated with the piezoelectric actuator changes between an actuated condition and an unactuated condition, and wherein the fluid chamber comprises a volume and an ejection nozzle.

The subject matter of claim 2 does not differ from the above. Claim 2 is not new.

- 4.1 Furthermore, in D1 (see especially figure 13a) the waveform signal is selected for the input terminal of at least two switches; the plurality of switches are connected in parallel; the piezoelectric actuator comprises a capacitance, each switch comprises a resistor.
- 4.2 In D1 (see especially figure 13a), the resistance from each of the plurality of switches and the capacitance of the piezoelectric actuator are arranged to form a low-pass filter circuit, which will necessarily filter high-frequency harmonics with the low-pass filter circuit to provide firing waveforms at the actuator that are consistent for a same pattern of input waveform signal.
- 4.3 The piezoelectric ink jet printer of D1 further comprising controlling the control signal terminal of each of the one or more of the switches of the low-pass filter circuit to form an effective resistance for the low-pass circuit that is based on one or more

resistors connected in parallel and the effective resistance comprises a parallel combination of switches that are active in the low-pass filter circuit, wherein an active switch comprises a switch with a high voltage on the control signal terminal of the switch and the switch is electrically connected.

- 4.4 The circuit of D1 further comprising varying a frequency response of the low-pass filter circuit by varying a selection of activated switches.
- 4.5 D1 (see especially figure 13b) discloses that the waveform signal comprises any of a step pulse, a sawtooth waveform, and a combination of two or more waveform patterns.
- 4.6 The subject matter of claims 2-11, 25, 26 does not differ from the above. Claims 2-11, 25, 26 are not new.

Therefore, the subject matter of dependent claims 2-11, 25, 26 does not satisfy the criteria set forth in Articles 33(2) PCT.

- 5 The additional features of dependent claims 12-22, 27 only concern minor modifications, which must be regarded as normal design steps for the person skilled in the art. A combination of any of the features of dependent claim 12-22, 27 respectively with claims 1 and 24 would not appear to add anything inventive (Article 33(3) PCT) and therefore does not seem to form a suitable basis for a new claim.

In particular :

- D1 (column 2 lines 17-26) suggests to compensate for inkjet direction variability between ink nozzles, increase print control, produce different responses, and produce different spot sizes for each print job (cf claims 13 and 14);
- D1 (see especially column 1 lines 49-50) discloses that the circuit is configured to charge a capacitance of the actuator, and wherein the circuit is further configured to discharge a capacitance of the actuator (cf claim 27).

Therefore, the subject matter of dependent claims 12-22, 27 does not satisfy the criteria set forth in Articles 33(3) PCT.